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HEAD TO HEAD

Should healthy people take a vitamin D supplement in winter months?

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Yes—Louis Levy

Getting enough vitamin D to protect musculoskeletal health requires eating the right types of food and getting short bursts of daily sunshine in summer months. However, for many people this can be harder to achieve than it sounds, and some people will need to take supplements in autumn and winter.

The Scientific Advisory Committee on Nutrition (SACN) reviewed previous recommendations[1] in the light of public health advice to stay out of the sun and wear sunscreen and accumulation of new evidence on vitamin D. It has recommended a reference nutrient intake—the amount that is sufficient to meet the needs of 97.5% of the population—for vitamin D of 10 μg a day to protect musculoskeletal health in people aged 4 years or older.[2]

Population protection

SACN based its recommendation on a review of the evidence on musculoskeletal health outcomes, concluding that there was insufficient evidence to make dietary recommendations on non-musculoskeletal outcomes and the risk of poor musculoskeletal health is increased at serum 25-hydroxyvitamin D concentrations below 25 nmol/L.[2] This concentration is not diagnostic of disease but indicates the level below which risk of poor musculoskeletal health is increased; it represents a population protective level. On the basis of modelling work, SACN estimated that 10 μg/day is the amount of vitamin D needed for 97.5% of the population to maintain blood concentrations at or above 25 nmol/L when exposure to sunshine is minimal.[2]

SACN's evaluation adhered to its framework for the evaluation of evidence,[3] which is based on an evidence hierarchy used to judge the strength of each study according to design. Most weight is generally placed on randomised controlled trials since only this study type can demonstrate a causal relation between an intervention and a health outcome. This approach takes into account the full body of evidence, not simply single studies.

It's not easy through diet alone

Vitamin D is found in only a small number of foods, including oily fish, red meat, liver and egg yolk, so it's not easy to get what you need from your diet alone. Some breakfast cereals and fat spreads are fortified with vitamin D.[4]

Most people will make vitamin D in the skin during summer, but the National Diet and Nutrition Survey shows that around 20% of people in the UK do not have blood levels above 25 nmol/L even in the summer.[5] Since it is not possible to identify these people SACN recommended 10 μg daily all year.

Public Health England advises that eating a healthy, balanced diet and getting some sun means you are likely to get enough vitamin D during spring and summer. But during autumn and winter the only source is diet and so everyone should consider a daily supplement of 10 μg during these months.

Some population groups are particularly at risk of not getting enough vitamin D, and people in these groups should take a supplement all year round. These include those who spend little time outdoors (such as people who are frail or living in institutions) and those who habitually wear clothing that covers most of the skin while outdoors.

People with darker skin, from African, Afro-Caribbean, and South Asian backgrounds, may not get enough vitamin D from sunlight in the summer[2] and should also consider taking a supplement all year round.

Avoiding harm

Taking 10 μg of vitamin D daily to prevent musculoskeletal ill health is unlikely to result in harmful levels of vitamin D.[2 6] The tolerable upper level for vitamin D is 100 μg/day for those aged 11 or older and 50 μg/day for children aged 1-10.[2 6] People who choose to take vitamin D supplements should therefore avoid taking multiple supplements containing vitamin D as doses will add up. Excess intake of vitamin D can result in hypercalcaemia, demineralisation of bone, soft tissue calcification, and renal damage. People with vitamin D deficiency will need higher doses and should follow the advice of their healthcare professionals.

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A key role for Public Health England is to keep the public informed of new evidence about diet and nutrition. Getting enough vitamin D is particularly important because poor musculoskeletal health remains in the top 10 causes of disability adjusted life years.[7] For many, a supplement will be necessary.

No—Tim D Spector

We have a strange love affair with vitamin supplements that makes the recent UK government message that everyone should take vitamin D in winter an easy sell. But is this recommendation evidence based? With a fifth of the population reported to have low levels is this a real modern epidemic or a pseudodisease? Will tablets cure us or prevent problems and, importantly, are they completely safe?

The thresholds of when we worry about blood levels of vitamin D (25-hydroxyvitamin D) are poorly defined and confusing. Deficiency and insufficiency levels were arbitrarily decided by clinical societies and international bodies without consensus. Thresholds for insufficiency vary from 25 to 75 nmol/L, but recent studies suggest 30 nmol/L is adequate for most people.[8] Clinical deficiency (<10 nmol/L, although some use <25 nmol/L) is usually clear cut because it is accompanied by raised parathyroid hormone concentrations. However, labelling people as deficient based on vague moveable thresholds that fail to account for large genetic influences that explain half of the variation will cause many false positive results and potentially overtreatment.[9]

Risk of harm

Most people assume that calcium and vitamin D supplements are safe. We used to think of vitamin E and A as harmless until trials showed the opposite. My clinical practice changed when recent evidence suggested that calcium supplements, as well as being ineffective prophylaxis against fracture, may cause heart disease.[10]

While the new recommendations for widespread vitamin D supplementation are modest in terms of dose (10 μg or 400 IU), they will inevitably lead to overdose in some. Many people already take additional sources of the vitamin—for example, in cod liver oil tablets or fortified milk, orange juice, or bread—or they buy high dose supplements on the internet. Patients with very high vitamin D levels (100-180 nmol/L) are becoming routine in clinical practice. Worryingly, several randomised trials have reported that patients with high blood levels or taking large doses of vitamin D (above 800 IU) had an unexpected increased risk of falls and fractures, suggesting that this vitamin can have unexpected toxic effects.[11 12]

Limited evidence

The government should not recommend any intervention without convincing evidence of benefit. Despite a few hundred systematic reviews and meta-analyses, a recent review found highly convincing evidence of a clear causal role of vitamin D does not exist for any of 137 outcomes.[13] As an example, obesity reduces serum vitamin D levels (and not the reverse) and could explain reports of apparent increases in prevalence of deficiency in the population.[14] It was widely believed that vitamin D supplements prevented cardiovascular disease, but most meta-analyses and, importantly, Mendelian randomisation studies have not shown any effect in humans.[15] The same is likely for osteoporosis.

The supplementation recommendation assumes that the data on preventing osteoporosis and fracture is good. Sadly, despite strongly held views by some, it is not. An independent Cochrane review team recently reviewed 31 trials and found no overall effect of vitamin D supplementation on fractures.[16] They reported a small effect on hip fracture (but only with calcium) and had to treat 1000 elderly people before preventing one fracture. The evidence is slightly better for elderly people in care homes with poor diets. But this is based on striking results from some early trials whose results were not replicated. More worryingly, the studies in elderly people show no clear benefits on muscle strength or mobility.[17]

We have unfortunately created another pseudodisease that is encouraged by vitamin companies, patient groups, food manufacturers, and charities. Healthy people should get vitamin D from small doses of sunshine every day plus dietary sources and trust that millenniums of evolution will have dealt with the fact that in northern climes our vitamin D level naturally drops in winter without us snapping our limbs.

About half the population already take vitamins daily even though they have repeatedly been shown to be ineffective and even harmful. Although vitamin D treatment still has a role in people with proved deficiency or in high risk groups such as infirm elderly people or at risk infants, the rest of us should avoid being "treated" for this pseudodisease, save scarce NHS resources, and focus on having a healthy lifestyle, sunshine, and a diversity of real food.

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